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Intelligence And Behavior.

INTELLIGENCE AND BEHAVIOR

BY

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I HEREBY RECOMMEND THAT THE THESIS PREPARED UNDER MY SUPERVISION BY Harry Amsterdam

ENTITLED Intelligence and Behavior

BE ACCEPTED AS FULFILLING THIS PART OF THE REQUIREMENTS FOR THE DEGREE OF Master of Arts

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I

THE ORIGIN AND DEVELOPMENT OF THE SOUL THEORY

Beginning with Anaxagoras down to the present day the problem of mind or consciousness has remained one of the central topics of philosophical discussion. No philosophical subject has received so much attention, and no philosophical subject has been so hotly contested as the problem of intelligence. That this is so can be seen from the enormous literature and from the fact that at present the study of consciousness can boast of being a special science, the science of psychology. One of the reasons why the subject secured so much attention is not only because it is itself an important field for philosophical study, but also because any definite stand upon this subject will affect one's entire philosophical outlook. However the case may be, there are a number of theories in which an attempt has been made to explain the nature and meaning of consciousness, There is the soul theory, which considers consciousness as due to some particular spiritual substance, while there is another extreme that would consider consciousness as a form of mechanism. Again there is the view that the soul consists of the unity of psychic life; while still another view, which is held by the pragmatists and which we are attempting to defend in this thesis, maintains that consciousness is a certain kind of relation. As to what kind of relation this is and as to how far our theory is justified in contrast with other theories, we shall discuss as we go along.

Perhaps the most significant fact about man, as contrasted

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with his environment, is the fact that man is a highly conscious being. Of course there are other beings beside man, from a monkey to a fish, which seem to possess a varying degree of intelligence or consciousness, but none of these seem equal in that respect to man. Of our own consciousness we seem to have no doubt. We simply say we know things and this is a fact. The only question left is what does "to know" mean as distinguished from not knowing. Of other beings we speak as conscious because they seem to behave in a way which is characteristic of ourselves when we say "we know", that is they perform acts that can be classified as conscious acts. We sometimes even speak of a puppet as if it were conscious. This "as if it were" is important, for by this we seem to indicate that although there is some similarity between the puppet and a conscious being, yet there exists at the same time an essential difference between the behavior of the two which is all the difference in the world between consciousness and non-consciousness. What then is this difference?

That there is a difference between conscious and non-conscious behavior is easily confirmed by experience. If we throw a ball into the fire, the changes that take place in the burning ball can be explained by mechanical and chemical processes. First there entered the energy of heat which separated some particles of the ball, then a chemical reaction took place which ended in the burning up of the ball,and this of course was neither a pleasant nor unpleasant consummation. The burning ball seemed to be indifferent to its fate. In fact it did not behave in a way which showed signs that it was conscious of its being burned. You can put the

ball in the fire only for a moment, take it out and then throw it in again to complete the process of burning. Each particular step in the process is determined by conditions already existing. That is to say, each antecedent is followed by a certain consequent without any reference to the welfare of the ball. With regard to ourselves, when we come in contact with the fire, not only do the mechanical and chemical processes take place, but we say the fire is hot, - "it is hot, it is painful!" Well, what on earth is that? Hot! painful! - not only do there seem to be mechanical and chemical processes, but something seems to be added to them. Moreover after we are once burned by the fire we are likely to keep away from it at a safe distance; that is, we know that it is hot, that it is painful, without the same mechanical and chemical processes occurring again. How are we to account for all this?

The "man on the street" if he were asked concerning the difference between himself and unconscious objects would probably reply - the soul! He has a soul, while those non-conscious objects have no souls, and not only that, but often he would assert that only men have a soul, while other animals, although conscious, yet have no souls, which alone is sufficient to account for the particular brand of intelligence which is peculiarly human. The latter, however, may only be a local opinion depending largely upon a certain type of religious training. Thus there are some who attribute to other animals a spiritual entity, yet explain the distinction between man and the lower animals by saying that man has a divine soul while the animal has a kind of "unclean spirit", a sort of minor devil. Others even go so far as to make

a similar distinction between man and man. The heathen, for instance - and heathen may sometimes mean all those who do not belong to a particular church - have only an animal soul, which, however, can be transformed into a divine soul by baptism or other religio-mechanical means. How this soul brings about conscious behavior, how it controls muscular activity, is a question to which many vague answers have been given. Nevertheless there have been current very definite opinions as to the nature of the stuff of which the soul is composed, which stuff largely varied with the degree of culture that had been attained. The idea that the soul is a spiritual non-spacial substance was by no means the first step in the soul theory. It takes a great deal of ingenuity and perhaps some amount of sophistication to make any distinction between the spiritual and the material at all. The early Hebrews, for instance, called the soul "רוח", which is synonymous with breath, or wind, or air, while the Greeks called it "πνεῦμα" which means breath, or "νοῦς", which was supposed to be a kind of fiery ether, - a quasi-material holy breath. There was of course some reason for these suppositions. They looked for the cause of conscious behavior. There was, however, no particular material part of the body which ceased to be when conscious life stopped operating. There was not anything as a part of the body that one could lay one's finger on and say that if this is present consciousness is also present, while when it is absent consciousness is also absent. In the case of the breath it was different. When a body ceased to be conscious, when it died, the breath was no longer there, it had departed. Ergo, the cause of consciousness must then be the breath. A closer ex-

amination of this mysterious soul failed to reveal any divine capacities. Air was air, fire was fire and nothing more, that is, outside the conscious organism. These substances showed no traces of consciousness and did not differ in this respect from other material bodies. True, air and fiery ether are, so to speak, very thin forms of matter, so thin as to suggest pure thought, nevertheless there was no reason why a gaseous vertebrate should perform greater wonders than a solid vertebrate. If matter was to explain conscious phenomena, one form of matter was as good as another, unless particular circumstances are taken into consideration. But people are not likely to scrutinize circumstances carefully when such a factor as consciousness and the possibilities of immortality are involved, especially when the circumstances are inadequate to proving notions which for biological reasons there is a tendency to establish without proof. They wish to know "who is the king behind the door of consciousness", and what is most important, they want him to be there. Verily it is the immortal homunculus who pulls the strings of the nervous system and makes the mortal body behave in a conscious manner.

One who is not disposed to swallow the entire theory at one gulp is likely to stop at this point, because of what under ordinary circumstances would be considered, to say the least, as an important detail, namely, what is the empirical evidence for this soul theory?

To this question the adherents of the soul theory reply that the soul is not a material object; it is spiritual - and by spiritual is meant here a non-spacial, simple, indivisible, trans-

cendental soul substance. The soul therefore is not a thing to be seen, heard, touched, etc.,nevertheless it is there, although the term "there" could not mean there in space.

In order to see what this soul substance means and whether it solves the problem of consciousness we will have to enter in some detail into the subject of substance for the purpose of discussing what is meant by that term and whether it is a term that can be applied to the soul. It seems, however, that these very negative qualities of the soul are the things which its adherents deem to be of the highest advantage, since these negative qualities are the "raison d'etre" of the immortality of the soul.

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II

SUBSTANCE AND SOUL-SUBSTANCE

Perhaps the best way to determine the validity and possibilities of the theory of soul-substance is to inquire into the nature of substance in general, from whence the concept of a soul-substance has been derived by analogy.

What is a substance? There is the common-sense and the metaphysical view of substance. To the common-sense view any object having some permanence in space, without any further reference, that is, the object as it is experienced, if it has permanence in space, is a substance. Thus a shadow is not a substance. The shadow is not only relative to position but can disappear out of space altogether. For the same reason, the common sense view looks upon a solid as being more substantiality than, let us say, a liquid; and a gas, a vapor, or a sublimate seem to be semi-substantial. A cloud of smoke is thus only a "mere smoke", because the particles of the smoke on separation give the impression that the substance had not only changed its position in space, but that it disappeared entirely. A solid, on the other hand, does not ordinarily vanish by mere change of position. You can hear then in ordinary language "solid", "substantial", "concrete", etc., used as synonymous terms. Of course it all depends on the amount of scientific training one has had. To the chemist, for instance, a gas is just as much of a substance as a solid. What is significant for our discussion is that to the common-sense view substance is experiential, that those qualities of the object given in experience are the very

things which go to make up the substance. To the metaphysical view substance is something more than the mere experiential qualities of the object. In fact the substance as such may not be experienced at all. The substance is the hypothetical something which subsists by itself or which supports the qualities which we do experience. The question is, have we any reason to believe in the metaphysical notion of substance?

It happens sometimes that we speak of a thing as having existence although it is not present to experience, because it helps us to explain certain things which are given in experience. It is a necessary postulate, a necessary hypothesis. Thus some physicists postulate an universal ether because it helps to explain the phenomenon of light. Well, as far as necessary hypotheses go there is no need for a metaphysical substance inherent in the object which is other than the qualities given in experience. The idea of an abstract substance originated in two ways, one of which is the double-approach method of referring to an experience - the "that" and the "what" of a thing. Any one who has a limited vocabulary when asked for a further explanation of the meaning of an experienced object will usually refer to the "thatness" of the object, that is, he will refer to the fact of experience in order to convey the meaning. For example, if a foreigner who knows very little English, but who knows to call a knife by its proper name, be asked to state what is meant by a knife and finds himself unable to give any definition in English he would be likely to point with his forefinger to a knife - "that! - that is a knife!" In this manner he tells us that this fact of experience means to us what

it meant to him, that is in certain situations we will adjust ourselves to it or by means of it in a particular way. One, however, who has an extensive English vocabulary may go over directly to the meansing of the object and say, "a knife is something to cut with"; that is, he will explain the meaning of an object in terms of behavior. The distinction between the "that" and the "what" is a functional, not an ontological distinction. The difference is a difference in our mode of approach, depending largely upon the given situation where the "that" plays the role of a possible adjustment taken for granted - a fact, while the "what" plays the role of a possible adjustment not yet taken for granted, but which will have to be considered as a particular kind of adjustment when it enters experience - "it means so and so ...". The difference then lies not in the qualities of the object, but in our attitude of cognition and verification of the qualities. Metaphysicians however separated the functional distinction of the "that" and the "what", of the fact and the meaning, as if they were distinctions of kind. There appeared the illusion that after it has been told <u>what</u> a thing is, something else is left unsaid which is the "that" of a thing. But as soon as you begin to say the least thing about it you somehow fall back on its meaning; that is, you must describe it in terms of behavior. In other words, as soon as you say that a thing "is", if this thing is to have any reality you must tell what it does. A real "is" always involves a "does", and this may perhaps throw light on our whole theory of consciousness, we shall therefore discuss it later on, but what is here important, is to see that if you separate fact from meaning you get a self-

subsisting substance, - or essence the only attribute of which is existence and, if strained a great deal, also causality. This separation, however, is psychologically impossible, since existence by itself without meaning cannot be distinguished from non-existence.

Psychologically the idea, or rather the illusion, of substance comes through the experience of touch, and change in the qualities of the object. When we touch an object there is a tendency on our part to break through to the "inside" or "core" of the object which blocks our movements. This inside appears to be mysterious. This tendency is especially noticeable in children who break open their toys to find out what is inside. We are always inclined to hunt for an imaginary "core" or "heart" of the thing. Again when we notice the coming and going qualities there is the temptation to make a comparison with the animate world and consider the coming and going of qualities as so many appearances, as dresses which the objects assume. "The earth", is thus "dressed in green verdure". **The first explanation of change was therefore animism.** Later on we came to see the important part environment plays in change. Animism was given up, but the object still retained its identity as something not depending upon its qualities. There remained an indefinable something - a substance which supported the qualities. When this abstraction had to be explained, it was found that it could not be done without referring to these very qualities which were supposed to be mere appearances. In either case the idea of substance appeared because of the lack of critical examination of the object. In the case of separation of fact and meaning the idea of substance is founded in shallow rationalism, while the

psychological illusion of substance is founded in a crude empiricism.

The idea of soul-substance came into existence by an analogy from substance in general. If qualities come and go and there is still left a substance which subsists by itself, so also mental qualities come and go leaving a residue of mental-substance. The characteristic of mental qualities and ideas is that they are non-spacial, therefore the soul-substance is non-spacial. From the fact that the soul undergoes no change, another negative soul attribute may be derived, namely, that it is non-temporal. If the soul does not change, it means that it receives no impression of change, that it is not affected by anything external. Time therefore is an indifferent matter to it; it is beyong time, it is eternal in a metaphysical sense and thus gains immortality. The advantage of this kind of immortality is not very evident. The immortality of a spaceless and timeless soul means a mathematical moment of blessed nothingness - which is a very dull and monotonous prospect. All this, however, depends upon private taste if it could only in some way explain the meaning of consciousness, and this is the very thing which the soul theory cannot do. In the first place, it does not explain how the soul brings about conscious bodily activities. All it possibly can say, is that there is some unknown homunculus who manipulates our actions, but what we are interested in is to know the relation between this soul and conscious behavior. In the second place, we are desirous of knowing what is the nature of the soul, so as to be able to establish whether all that is ascribed to it is possible. What do we find?

We find not only that soul-substance does not explain conscious behavior, but that from the very nature of the soul it follows that such behavior, as far as human knowledge goes, is impossible. How can a spaceless soul affect a spacial nervous system? The answer is that this cannot be made intelligible. To be sure, the soul is often spoken of as having certain faculties, but there is no possibility of establishing an intelligible connection between the soul and its faculties, nor between the faculties and conscious responses - they all remain detached. Faculties there ought to be, somehow, somewhere; while the soul as an eternal, immaterial substance is somehow nowhere. The soul is thus not only an unnecessary postulate but a confusing one. The law of parsimony is therefore not the only reason why the soul theory as an explanation of consciousness should be ruled out.

III

CONSCIOUSNESS AS A THING AND AS A RELATION

The failure to explain intelligent behavior on the basis of soul-substance gave rise to the psychological theory of mental states or processes as a substitute for faculty psychology. As to the origin and nature of mental processes there exists a variety of opinions, chief among which is that of the interactionists and the parallelists. According to the former, whose theory is based on Locke's sensationalism minus the mind substance, external activities affecting the body produce such things as mental states and these mental states in turn control muscular activity. This view seems to be simple enough except for its difficulties, which difficulties could not be removed except on condition of refraining from asking any further questions. In other words, the simplicity of interactionism is not due to its profundity but to its naivete. To the uncritical mind nothing is more convincing than that which is dressed up in a garb of causality. And, indeed, does not consciousness arise when the body comes into contact with the external world? And does not muscular activity appear in conjunction with the phenomenon of volition? Hence one must always be the cause of the other by reciprocity. But how do causes operate in this case? and what is this thing called consciousness? "Here lie the remains of interactionism of blessed memory".

To begin with, mental processes are of a different stuff from that of material objects, - they are spiritual, that is, they are not spacial. If this be so, how can a thing which does not

occupy space control a spacial nervous system? How could there be a causal relation when causation by its very definition means a relation of and continuity with points in space? How could causation manifest itself when there is no possible spacial contact? To say that a physiological process as a brain event can produce such a thing as a mental state without denying the fact aht the said physiological process is a closed circuit is something contrary to the law of conservation of energy. Besides having troubles of its own, interactionism has no advantage over the soul theory, since it fails to explain intelligent action. To remove the particular difficulties of interactionism seems to be the task of parallelism.

According to parallelism mental states are not the result of bodity activities, nor do they control the body, but as an accompaniment to every nervous activity there is a simultaneous mental process, - a spaceless shadow trailing along the path of innocent determinism. And this is intelligence! It is evident that parallelism instead of removing the difficulties of interactionism is like any other theory which starts with fundamental fallacies - the further it explains the more it leaves to explain - to explain its very explanations. In the end the explanations of parallelism bring us back to our original problem: What is intelligent behavior and how is it possible? If our mental states have nothing to do with our bodily activities, then the body is only a complex mechanism, which leaves no room for intelligent activity, no room for profit from experience and consequently no room for control of environment, without which it would be impossible ever to argue

in favor of the theory of parallelism. Why does an organism whose activities can be explained in its own terms need mental states? Does it exist merely in order that psychologists may have a subject matter for study?

Outside of the particular difficulties which beset the respective paths of interactionism and parallelism there are some difficulties which all species of "mental state" psychologies have in common. In the first place, what is it that gives unity to the mental states? In the second place, if all that we can possibly know are these very mental states, what right have we then to speak of a world existing outside of these mental states?

Suppose then that we resurvey our original material and see what other possible solution of the problem it might offer. Our given material is a body and its environment. So far nothing else is given, and it is only when there is an interaction between the two, and an interaction of a specific nature, that we detect what we call intelligence. Intelligence, then, so far as we can infer from the given material, is a relation between the body and its environment. We detect it by the particular way in which the body behaves toward its environment. Our problem then is to determine what kind of behavior this is.

A chemist describing the characteristics of an acid in its relation to a metal is apt to say that the acid behaves in such a way as to form metallic oxide, or the metal behaves toward the acid so as to generate hydrogen. To economize language the chemist often speaks of the strength of the acid or of the solubility of the salt, etc. This however is merely economy of lan-

guage. The chemist does not intend here to hypostasize the strength of the acid by considering it as a thing that can be separated from the acid in contact with some other object; as something which is inherent in the acid possessing causal capacities with regard to an acid-metal reaction or acid-salt solution. No! It is only a shorthand way of describing the chemical relation between the acid and some other substances; it is a description of a situation between two objects and can be described arbitrarily in terms of one as well as the other. The same analysis applied to consciousness gives us a clue to the fallacy of traditional psychology. The fallacy consists in the hypostatization of consciousness, in considering consciousness as a species of thinghood with causal capacities other than the situation created by a body and its environment; by considering it as a third external factor which entered voluntarily from an unknown region. To speak of consciousness as a thing by itself is the same as speaking of the strength or acidity of an acid as things by themselves. What we have in a conscious situation is not three things - a body, consciousness and environment, but two things, - a body and its environment - consciousness being the name for a relation between the two. In order to explain the meaning of consciousness we must find out the type of relation existing between an organism and its environment, when a situation is said to be conscious. What kind of behavior is intelligent behavior as distinct from mechanical action, when we start with the proposition that two and only two things enter into relation?

Suppose that we take a mechanical object such as a puppet of a Punch and Judy play; we pull the strings and the puppet moves

its arms and legs. Now if by pulling the strings one of its arms happens to come into contact with fire and is somewhat burned, we can still continue to pull the strings and the puppet would manifest no objection to being burned again. The puppet has not learned anything from experience, nor does it seem to care for the future. This is where the difference appears in intelligent or conscious behavior. If a child burns its hand it learns from experience and behaves with reference to the future - to the future of either being or not being burned. The fire acquires a meaning for the child. It is conscious of the fire, because it reads off in it something which the puppet did not; it reads off in the fire the fact that it will burn. The child need not put its hand into the fire for a second time and withdraw after actually being burned, but sees the possibilities of the fire and behaves accordingly.

To behave with regard to the possibilities of the fire is what seeing means; to see the fire is to see that it will burn. Conscious behavior is the ability to control the body with reference to the future; it is control of the body by a purpose, and the purpose may be construed in terms of biological adjustment. What we can say so far is that consciousness is a purposive relation. Our task now will be to examine this relation a little more in detail.

IV

INTELLIGENCE AND BEHAVIOR

In the preceding chapter we insisted that intelligence is a relation between an organism and its environment, just as the strength of an acid is a relation between the acid and a metal or a salt with which it comes into contact. From this it would follow that intelligence is not a thing or entity in a causal sense, which determines the relation between the organism and its environment, but that the very relation itself, because of its peculiar character, is called intelligence. By this we also mean to imply that, although consciousness is a name for a relation, the same as the strength of an acid is a name for a relation, yet there are relations and relations, and that intelligence is a relation of a peculiar kind. This peculiarity, as we have previously mentioned, consists in the fact that intelligence is a relation of control, - a type of behavior where an object or objects of the environment control with reference, not to what is actually happening at the moment, and at that particular moment affecting the body, but with reference to what will or may happen in the future. To put it in other words, intelligence is the ability to telescope, the ability to transfer the future into the present; not to actually experience the future by a mechanical impact as in the case of the acid and the metal, but to foresee what would happen if that mechanical impact were to take place. Intelligence is not, as Kant would have us assume, a case where the transcendentally ideal becomes empirically real. It is not a situation embodying a strange static mixture of mechanism with a foreign transcendental element where,

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through the medium of purely abstract and therefore inconceivable temporal schemas, are transformed the still more abstract and therefore still more inconceivable non-temporal idealities. Intelligence or consciousness, as will be borne out by physiological evidence, is a purely active, dynamic relation where the teleologically ideal becomes empirically real. An act can be called intelligent when the body behaves with reference to a purpose or end.

Now it seems that so much every one will admit, namely, that if a being can foresee events, if it can avoid dangers or attain definite purposes, it deserves to be called an intelligent body. As a matter of fact, this generally serves as a criterion to test intelligence. This however is not the whole story. Although all seem to agree to the quality of an act that may be characterized as intelligent, yet not all will admit that intelligence is constituted by that act as it is. There seem to be two extremes of opinion in regard to this matter, both of which try to find behind the purposive act something else. On the one hand there are the mechanists who maintain that although an intelligent act appears to be purposive, yet that this is only apparently so; that after all the conscious act can be reduced to a simpler explanation of mere push and pull - to mechanism. On the other hand there are the transcendentalists who maintain that there is something behind the entire situation, that is, not only behind the act, but behind the actor and the environment as well which makes intelligence possible. These theories would deserve some separate discussion if our object were simply to deal with the proof or disproof of either of these theories. Since, however, our object is

a particular thesis, we shall have done sufficient justice to any theory if our own explanations of consciousness will imply a possible refutation of any other hypothesis.

To proceed then: If consciousness is a relation we must find out what happens to the things related; what happens to the organism and to the object of its environment which makes this relation possible, keeps it in this related state and develops it. We must also find out whether under the given condition the material could not function in the same manner without constituting this typical relation. The question here is, what services this type of relation performs that could not be performed otherwise. Since we are dealing here with living organisms, the question becomes highly imperative: "What is the biological use, what is the biological need that this type of relation supplies?"

Suppose then that we turn to physiological facts. We find an organism endowed with what we call the capacity for reflex movements. These reflex movements are mechanical, mere push and pull, so to speak. Given a certain stimulus antecedent in time, a certain consequent will follow. No one is conscious of his own reflex movement; no one is conscious of the circulation of his blood, of digestion and other reflex movements, unless something happens to the machinery or unless, for some reason, he makes an effort to examine them, in which case there is some need to be satisfied. What then happens to the nervous system that it could not by the same reflex movements adapt itself to its environment? One may ask, of course, whether nature could not create a nervous machinery which by mere reflex movements would be able to adapt

itself to all possible situations. The answer to this question I shall leave to those who find it profitable to instruct nature in their own particular economy. We shall meanwhile see why a given nervous system could not adapt itself of purely reflex movements by referring to what actually happens.

If we compare beings of a lower with those of a higher degree of intelligence, we find that among the former the entire neural apparatus is more or less fixed, rigid and determinate. That is, an incoming nerve current will result practically in the same responses every time, since it does not affect to any great extent the other neural centers. In the proper environment an animal of this kind can thrive without much conscious effort. Nature in the process of evolution has endowed it with a nervous system fit to respond and to survive in that environment. There is a continuity of interaction between the organism and its environment which makes for the survival of a given species. The animal does not have to do much learning; it "knows" what to do at the start. These capacities of the animal are inherited. These inherited advantages, however, cease to be such as soon as the animal is taken out of its environment. When the environment is of such a nature as to offer different stimuli and consequently demanding respectively different responses, for which the animal has either no capacities at all, or the responses are of such a rigid nature as to be always the same to all sorts of stimuli, so that adjustment is impossible or at all events difficult, and the chances for survival are consequently small. In the case of a more intelligent animal, let us say a human being, the nervous system is much more compli-

cated, flexible, and indeterminate. Both the animals of a higher and a lower degree of intelligence are born with inherited motor apparatuses. In the case of the higher animals the nervous system is so organized as to allow for a greater variation of responses, since it possesses the capacity for combining in a variety of ways different responses and also because the sense organs are of such a nature as to furnish the organism with a greater variety of stimuli. This greater complexity of organization is precisely the cause why the organism could not be biologically efficient if it were to work purely on the principles of mechanics. In the first place the same motor apparatus may be controlled by different stimuli, as in the case of eye movements, which may be controlled both by visual and auditory stimuli; or one stimulus may set off more than one apparatus, since any muscular movement may be effected by some nervous center other than the cerebral cortex, so that more than one response will tend to occur in connection with a single stimulus. There appears then the possibility for a conflict and blocking of the responses. It is precisely out of such conflict of incompatible responses that consciousness arises. Mechanism, so to speak, did all it could, but it ended in a dead lock. In order that the organism should survive, a reorganization of responses is necessary, and this reorganization of responses is that which makes the stimulus a different one from what it was before the reorganization. Thus the fire may set off a movement to reach for it, but at the same time, owing to the impression left on the nervous system on a previous occasion, it sets off the response for withdraw-

al. In order that the organism should survive, the stimulus must be transformed so that the organism can escape from the maladaptation caused by a tangle of conflicting responses. The fire becomes a stimulus which reveals its potentialities without testing them, and this, on the other hand, is possible only because the responses have been so organized that the last movement of the first experience appears as the first and direct response to the stimulus. We then become conscious of the fire as being hot, namely, we behave towards the fire as if it burned us at this particular moment, although at this particular moment we do not have the experience of a burn. The experience we do have at this moment is of a "will burn". What is true of this case is true of all others. Thus we keep our eyes half closed when we look at the sun, tend to move our jaws when something appetizing is presented to us, although we are not as yet chewing the food. In all these cases the stimulus provides its own response and may even strengthen it, while the response keeps on bringing into clearer outline the stimulus. If we do not keep on looking at the fire, that is, if the stimulus does not control us any longer, we do not see it any more. The future result of the stimulus must keep on controlling us in order that a definite response may follow. On the other hand, the response did appear directly to a fire as being hot, but began with a response to a different stimulus and only as a consequence of the reorganization of responses; as a result of modification of the nervous system, does the fire appear as hot. The tendency to respond to the first stimulus is still present, but the "futurity" of the object prevents it from being carried out and therefore goes over

into a modified response, namely a response to what will happen. This response to future possibilities is precisely what we call cognition.

From what has been said up to now it would seem impossible for experience to get a start, for if experience means to be able to foresee future consequences, how could we foresee future consequences when there was no previous experience? Now the fact of the matter is that even the first experience becomes an experience because the organism is guided by the future. In the case of the first experience it becomes an experience as a consequence of blocked responses which influence and transform the stimulus. But this transformed stimulus is called "transformed" precisely for the reason that it can organize the blocked responses so as to carry out a response which could not have been carried out were the stimulus to remain the same in its effect as before the blocking occurred. The response which follows after the organization of responses took place is therefore a conscious response, namely a response to a stimulus which was not present before the blocking occurred, but a stimulus which the blocked responses themselves provided so that an effective organization of responses might be possible. This response to a new stimulus provided by the blocked responses for purposes of adjustment as contrasted with the responses, as far as they have been carried out up to the point where they came into conflict, that is, to the point where they worked automatically as a consequence of an object mechanically affecting the body, is respectively the contrast between a conscious response and a reflex movement.

A specific example of an instinctive response will show more clearly that the first experience is a response guided by future consequences. A case in point is a babe reaching out instinctively for a ray of light. The ray of light effects incompatible responses. If the result ends in reaching it means that this response was one of those which originally brought about the conflict. As soon as the conflict of responses occurs the stimulus is transformed; it is a transformed stimulus, because the object,- a ray of light, stands now in relation to a different organism, - to an organism with blocked responses. The blocked responses, - i.e., the acts still suppressed, have an influence on the stimulus. As a result of this influence the object becomes a stimulus for reaching. The fact that the result was a response of reaching instead of some other response means that this response was stronger in determining the quality of the new stimulus, that is, before the child completed the act of reaching, this response gave to the experience an exciting quality, or as James said, the object as first seen is a buzzing confusion. It is an "exciting" experience because the response to reaching has not yet been completed, but at the same time this "excitement" shows the particular kind of organization of response the new stimulus evokes in reorganizing behavior; it makes the response to reacting victorious over all the other tendencies and in this sense helps to complete it. Moreover, the character of the new stimulus is determined with reference to biological adjustment. The response which it makes possible was already nascently present, and it is a response which, if completed, would promote the interests of the organism. Nature

in the process of evolution has made the child so that the influence to reach is strong and to yield to that influence is good for the development and survival of the child. In other words, even a first conscious act is determined by future consequences or results.

There is of course a certain distinction between instinct and what is commonly called intelligence. But this distinction is only a matter of degree and not of kind. A higher development of intelligence comes into being because of the biological insufficiency of instinct. In the world of conscious behavior instinct is an evolutionary prerequisite to higher forms of intelligence, which means that higher intelligence is only a further development of instinct. Both instinct and intelligence are forms of consciousness, and those animals which have the highest capacities for intelligent behavior are precisely the ones that show the least capacity for adaptive behavior at their birth. A human being a month old, if left to itself, would be helpless in comparison with lower animals of that age. The lower animals not only possess the capacity for reflex movements, but can also adapt themselves, within a limited range, to the needs of the moment. This adaptation is mostly performed by instinct. An instinct is however a conscious affair; it is a response to a transformed stimulus, and so far it is guided by the future. The chick pecks at the grain or at the caterpillars because grain and caterpillars are things to be pecked at. If, for example, cinnabar caterpillars are thrown to the chick instead of grain, it will still keep on pecking, but - only for a time, until it learns to discriminate. But discrimi-

nation means that the situation at one time became problematic, that an element of doubt entered into it; "is it to be pecked or not to be pecked" - the chick becomes for a moment a Hamlet in it own sphere. We thus see that even lower animals show some degree of the higher forms of consciousness, although not high enough to form concepts. There is also the difference between instinct and higher forms of intelligence, that the capacity for an instinctive response is inherited. There is this direct cognition or transformation of stimulus without the element of doubt first entering into the situation. The chick did not learn to peck caterpillars, but "knew" to peck from the very first moment of its birth, the same as the babe knows to nurse at its mother's breast, but either one can be weaned from particular modes of taking food by introducing a situation where a modified response will be biologically necessary. If this were not so; if, let us say, the chick would go on pecking at cinnabar caterpillars, we should not be able to distinguish such pecking from a reflex movement. The distinction then between animals of lower and higher intelligence consists in the fact that among the lower animals, especially those with whom instinct is in greater use as a means of survival, it takes a comparatively strong stimulus and longer time to modify the instinctive response. The degree of animal intelligence varies with the range of modification of responses.

V

THE PROCESS OF DISCRIMINATION

Our problem has thus far brought us to the conclusion that intelligence is the peculiar ability to adapt oneself to the needs of the moment. The needs of the moment vary, and in order to be able to adapt ourselves to a variety of situations we must possess the capacity for a variety of responses, which means the ability to discriminate. This ability to discriminate ranges from the cognition of various objects to the formation of concepts. Our present task is to find out the origin and development of the process of discrimination.

That the process of discrimination starts with instinct we have shown to some extent in the previous chapter. If we take a specific instinctive act, such as a child reaching for a piece of sugar and putting it in its mouth, all we can say from our point of view in this case is that sugar is a stimulus for putting it in the mouth, or for eating. How then do we come to discriminate such qualities as whiteness, hardness, etc? If is only when an object similar to sugar, and which therefore also serves as a stimulus to putting into the mouth, but which, when put into the mouth, becomes a different stimulus, let us say, a stimulus to withdraw, that the process of discrimination begins. Here as in any other case of consciousness a blocking of responses occurs; the whiteness and the hardness of the object are both a stimulus for taking the object into the mouth and for withdrawing it, the result of which is a reorganization of the responses, which may end in a closer examination of the object. After the examination of

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the object a number of things may follow. In the first place, we begin to discriminate between sweet and some other taste. There is the distinction between the object as a stimulus to eating and the object as a stimulus to withdrawal. In the second place, we begin to discriminate between white and white, hard and hard, etc., which may determine our behavior in the same way as taste. One white is a stimulus to eating, while another white may simply mean that the object is not to be taken notice of at all. Simple qualities are after all not so simple as they first appear to be. A simple quality involves ascomplex a situation as any other object, and the discrimination between simple qualities as well as between objects involves both the process of analysis and synthesis. Red as distinguished from other qualities may evoke a definite response, but the discrimination of various shades of red likewise involves a definite and specific response. A dog may evoke a definite response as distinguished from other animals, but may also evoke a response such as to distinguish it from other dogs; and even the "same" dog may evoke one form of response when it is chained and a different form of response when it is let loose, just as the "same" shade of red may in one case mean danger, while under different circumstances it may simply mean a necktie. As to what the object really means is always determined by the situation; by the way we behave towards it, by the way we adjust ourselves to it. The transformed stimulus solves the problem between the conflicting tendencies of response; it makes a fact a particular kind of fact, it gives it a definite meaning.

The capacity on the part of a transformed stimulus to

particularize a fact, that is, to give it a definite meaning, throws light on our problem of fact and meaning which we have discussed in a previous chapter. In our previous discussion we have come to the conclusion that the distinction between fact and meaning is not a distinction in the kind of an object, but a distinction in the function of the situation. The fact sets the problem, while the meaning is a name for the way the object controls us; it is a way of telling what kind of a fact the fact is. For example: I hear a noise; this is a fact, namely it sets a problem as to how I am going to adjust myself to the noise, but in so far as I do adjust myself, in so far as the noise controls me in a particular way, it also has a meaning. I find that someone is rapping at the door, and I say "that is what the noise meant". As soon, however, as the adjustment is completed a new situation arises. The meaning - the rapping at the door - tapers off into a fact and as such it holds a new meaning. It may mean burglars or the wind or what not, as to what kind of meaning a situation holds depends on the kind of adjustment it demands, on the form of control. If an adjustment is completed a new situation may arise and with it a new fact and a new meaning, etc. The reason why a meaning tapers off into a fact with a new meaning, i.e., the reason why a new situation arises, is because the new stimulus which organizes the suppressed responses and thus solves the problem and completes the adjustment, modifies our entire experience. A modified experience means a modified stimulus and therefore a new situation and this may go on. This also explains why, as we go along on the street,

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we often hear sounds, see colors, turn at corners, dodge street cars, why we behave towards those things as if they had no meaning at all, while at the same time we are conscious of the facts. The truth of the matter is that those experiences do have a meaning in so far as they guide us toward a certain end; they have at least a negative meaning. If our direction is towards a green house and we see on our way a red house, the seeing of the red house means that it is not the house we are after, that it is something not to be noticed. The same is true if we see a green lawn or any other distracting object. The reason why the meaning seems to be"weak", why we do not stop to say, "this means so and so" is because these objects, the red, the green, the corner, the street car, as stimuli, have organized to such an extent the conflicting responses from the time they have become objects of a first experience that they can control us easily. Through constant familiarity with these objects the nervous system has become so modified that these objects under given situations are no more problematic; their meaning has practically faded off into fact. We see a speeding automobile and we dodge instinctively, as it were. The meaning of the speeding automobile has become for us a fact as soon as we see it. But this fact may carry with it a new meaning. "What does it mean" we may ask, "has he a right to speed at that rate on a crowded street?" We may however drop the fact and with it its particular meaning, because we are in a hurry to get somewhere and we cannot stop to bother with this fact. In the same manner do we turn at corners. The corner controls us and has therefore

a meaning, but we do not stop to think of the meaning because it is not problematic, we simply turn, and as soon as we turn we may forget the corner altogether. We say we turn at corners and dodge automobiles instinctively, but as a matter of fact this turning and dodging is not instinct proper in its origin, as the instinct of animals. Our mode of behavior, however, towards these objects, especially when they do not constitute present purposes, is similar to the instinctive behavior of animals. It is in the nature of habit - a capacity to behave in an instinctive manner not inherited, but rather acquired through a repeated organization of conflicting responses and elimination in a more or less large degree of the problematic element.

The fact that an object may in the process of discrimination acquire different meanings gives us a clue to the formation of concepts. A concept is only a further development of discrimination or meaning. We know from our experience that a variety of meanings may be attributed to a single object, and for the economy of thought we bind them together under a single term. The distinction between conceptual knowledge and particular discrimination is the distinction James made between "knowledge about" and "acquaintance with". I have a concept of a house, which means that I know about a house a number of things. The house may be here or there, it may mean a kind of house that differs from many other houses, or it may mean something particular in a house or different from its parts. The various ways I have adjusted myself to a house that came within the range of my experience I have ab-

stracted and symbolize them by the term "house", and am ready now to consider them; I am ready to make a variety of ways of adjustment. A concept then is an attitude of preparedness for a variety of ways of adjustment. Now as to how I will actually adjust myself after the preparedness takes place depends upon a particular concrete situation and not upon the concept. This does not mean that I do not adjust myself to the concept; I do, but no as a concept, but as a stimulus the response to which is preparedness, the significant fact about this stimulus is that when it is related to an actual environment it is capable of accomplishing a larger adjustment. For example, I hear a speech in which the concepts, "blue," "honesty", "house", "day", are made use of. Now if I turn upon these concepts as parts of experience, I do not find anything to lay my finger on, that is, I do not find anything which constitutes a house in itself, "houseness", so to speak, nor are there such things as "blueness" or "honesty" as things in themselves. These concepts, in other words, are not pure abstractions made up of mental stuff. The question that arises now is, to what have we responded, if "blue", "honesty", "day", as concepts, are not the objects of experience? We certainly must have made a response to something, otherwise it would not be an experience. All we can say is that we respond here to certain sounds or words,and if these words cannot be connected with the rest of experience they do not mean very much. They do however acquire a rich meaning when they are strategically connected with other situations. If, let us say, some one enters my room and calls out the word "honesty", without reference to anything else, it is hard to tell what he means

beyond a mere sound, but on the other hand, if I hear a speaker talking about honesty connected with certain human activities, then this concept means a great deal. A concept then is the bringing in of a stimulus in a certain situation to be used as a tool, and it becomes a very effective tool if it fits the situation. A match when ignited by itself means only the burning of a small piece of wood, but when attached to a stick of dynamite it means an explosion. The same is true of a stimulus used in a conceptual manner; it is as important an instrument in a conscious or purposive relation as a machine in a mechanical relation.

We have spoken of a concept as being "knowledge about", but it is knowledge about in so far as it can become "acquaintance with", and there must have been a previous "acquaintance with" to make possible a "knowledge about". The relation of "knowledge about" to "acquaintance with" is the relation of fact to meaning,- the "knowledge about" standing for meaning and the "acquaintance with" standing for fact. I say I have some knowledge "about" chemistry. I could not say I am "acquainted with" chemistry, because chemistry is used here as a concept, a meaning. But in order that this term chemistry should really have a significant meaning, I must become "acquainted with" chemical substances. I afterwards organize my various "acquaintances with" chemical substances and symbolize them by one term "chemistry". Now as far as the sound of the term chemistry goes, it has its own "acquaintance with" and "knowledge about", which means a meaning and a fact. I becomes however such a wonderful "knowledge about" because when used to symbolize various "acquaintances with" it can carry out a variety

of adjustments, it can further organize experience and as soon as it does organize experience it becomes an "acquaintance with".

VI

THE MEANING OF PERSONALITY IN HUMAN EXPERIENCE

Our entire discussion has thus far revolved about a definite meaning, to wit - about a typical relation, a relation in which the environment controls the organism with reference to an end. If this is so, if consciousness is a relation, where is there any room left for a "self" outside the body that is being controlled? Nevertheless the important fact about experience is that _I_ feel, _I_ think, _I_ choose, that the I is always present in experience, that it permeates the very relations of the body to its environment. The category of personality which expresses itself in such terms as "I", "mine", or "me" seems to give unity to our experience and yet if we turn upon our experience we do not find the presence of the "I" over and above the conscious relations. What then do we mean by personality and where is it to be found?

Suppose that we take a concrete case where the category of selfhood is present. If I say I see my house among many other houses this object of my experience, namely my house, is here a particular fact with particular meaning. The meaning is here indicated by the term "my" which means that there is no subjective "I" which has the experience, but the fact, the object which controls my body reveals an "I" quality. It has a particular meaning which means a particular function of control.

Some consideration of the distinction between fact and meaning will perhaps throw more light on the issue. We have seen before that the distinction between fact and meaning is a function-

al distinction; the fact is a name for that which sets the problem, while the meaning is a name for the way we solve the problem, for the way we adjust ourselves to the fact. The meaning is a name for the particular control the fact exercises when it enters in our cognition as a particular fact. Now when I say I see my house among many other houses, this house of mine is a particular fact where the quality "I" is present. Here the other houses, so far as I am conscious of them,have also meaning, either as objects which guide me towards my house or simply as objects which are not to be noticed any more; at any rate as soon as they turn into facts, as soon as we have adjusted ourselves to them in such a way that they do not offer any farther problems for adjustment, they cease to have meaning and in this manner also drop out from cognition as facts. We do not pay any attention to them. An entire range of experience may thus appear to be almost meaningless. We jump so to speak directly at the facts by leaping at an enormous speed from one to the other in a sort of kinematographic fashion. However among all the so-called meaningless experiences my house stands out distinctly, both as a fact and as a meaning, because it still sets a problem, it still controls me. My house gives a certain zest to my experience because it offers a purpose and this very purpose is precisely the content or a phase of personality, since it is the purpose which by adding certain things and eliminating other things as meaningful factors in our conscious life gives unity to our experience. When I speak of a thing as "mine", I simply mean that this thing one way or another enters my purpose or system of purposes, although I may at the moment not be directly acquainted with the thing I call

"mine". I can speak of <u>my</u> railroad in Australia, although I have never seen that railroad; it is nevertheless "mine" because other things which help realize my purpose can be traced back as dependent on that railroad. I may speak of the Tsar of Russia as my enemy, although we may not know each other directly. I know however that our purposes conflict; his purposes are against my purpose which is the same as saying that he is against my self, my I; he becomes mine - the negative"me" - my enemy.

It is evident that if one is to have a distinct personality he must no only have purpose, but his purpose should constitute a unity. It is by the unity of purpose that we distinguish personality, and the more comprehensive purpose is, that is, the more a number of lesser purposes are subjected to and cooperate with a larger purpose, the more distinct and greater becomes the personality. If, let us say, the comprehensive purposes of the same man are in continual conflict then he becomes in a certain sense his own enemy, - a dual personality. As Goethe says in Faust:

"Zwei Seelen wohnen, ach! in meiner Brust,
Die eine will sich von der andere trennen:"

because

"Die eine hält, in derber Liebeslust,
Sich an die Welt, mit klammernden Organen;
Die andre hebt gewaltsom sich vom Dust
Zu den Gefilden hoher Ahnen."

Goethe's two conflicting souls is a name for the two conflicting attitudes toward the world; it is a conflict between two uniform methods of adjustment, which means that there is a conflict

in the world's control of the body, and hence a conflict of purposes.

That a unity of purpose, that a certain constancy of adjustment to the world, is what is meant by personality can be seen from the fact that we somehow do fail to perceive personality where there is a lack of regularity in behavior. We say that such a person lacks character. He is tossed about on the waves of life without any aim, without any purpose. You cannot tell what a person like that is going to do next. On the other hand a man of whom you can predict that he will behave in some certain way under given conditions you speak of as a man of character or personality. It is not that you know exactly how he will behave, but you do know that he will take a definite attitude towards given conditions; you know that he will take a definite stand, "he won't stand for it" you are apt to say, or "he will do something about it", etc.; you indicate that he has moral backbone. A man has personality and intelligent personality if he can foresee distinctly the future possibilities of a situation and harmonize his world accordingly.

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